ESD FACILITY SERVICES CAD STANDARDS

This document describes the standards to which computer-aided design (CAD) deliverables are required to adhere. Submittals that deviate from these standards shall be deemed unacceptable and returned to the consultant.

All review submittals and record drawing submittals shall be provided in the form of CAD files. The requirement to provide CAD record drawings may be waived by project managers where the production of said drawings are impractical and/or inappropriate, or for portions of a drawing set such as standard details, manufacturers' catalog sheets, shop drawings and other drawings not typically produced using CAD. The Project Manager may grant exceptions to some or all of these requirements.

Files shall be submitted on CD-ROM, or via e-mail attachment. Submittals of a size greater than 10MB shall be distributed and delivered on CD-ROM.

1.   Drawing Format

    a.   Software Standards
        CAD drawings may be created using any software capable of meeting the defined standards, but all submittals shall be provided in .dwg format and shall be compatible with AutoCAD release 12, 13 or 14, as written and licensed by AutoDesk Inc. 2320 Marinship Way, Sausalito, CA 94965. Additional CAD software or add-on software packages shall not be employed if their use creates proxy objects or other entities which cannot be fully manipulated using only AutoCAD. Consultants using software other than AutoCAD are responsible for confirming, prior to distribution, that all CAD files comply with these standards.

        Files shall be in a format compatible with the Microsoft Windows operating system. The compatibility of files created on computers using other operating systems shall be verified prior to delivery.

    b.   Drawing Contents
        Record drawings shall not contain layout lines or other extraneous elements. Files shall be purged of unused blocks, linetypes, fonts, or similar elements.

        Drawings for projects involving renovations shall differentiate between existing, new, and demolished construction.

    c.   Title-blocks
        The ESD Facility Services' standard title-block shall be used for all contract document submittals. Copies these title-blocks, in AutoCAD format, are available from the Project Manager.

    d.   Layering Standards
        All CAD drawings shall conform to the American Institute of Architects (AIA) layering guidelines, as defined in <u>CAD Layer Guidelines: Computer-Aided Design Management Techniques for Architecture, Engineering and Facility Management (Second Edition)</u>, published by the American Institute of Architects Press, Washington, D.C. The Project Manager may approve alternate layer standards in cases where a consultant's CAD system cannot reasonably be adapted to the AIA guidelines.

    e.   Fonts and external references
        All fonts and external reference files that are used in the drawing files shall be included with their respective drawings. Wherever feasible, only standard AutoCAD fonts will be used;

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non-standard fonts that cannot be provided without violating software licensing agreements or copyright regulations, shall not be used. Font and external reference addresses shall be relative to the delivery disk, not to an "absolute" directory on the original system.

f.   Drawing scale
All drawings shall be drawn at full scale. When a drawings contains elements to be plotted on the same sheet but at differing scales, AutoCAD's paper space shall be used or details shall be created as separate drawing files, at full scale, and inserted on the "drawing sheet" with appropriate scale factors.

g.   Drafting accuracy
Lines and entities that are designed to meet or intersect shall be "snapped" to ensure accurate connections and relationships.

h.   Entity colors
Entity colors shall be defined "by layer", not by entity.

i.   Dimensions
Dimensions shall be associative, relating directly to the actual dimensions of CAD entities. The values of dimensions shall not be edited by hand.

j.   Drawing origin
Site plans, building plans and the plans for specific disciplines shall all have the same origin point, such that drawings can be overlaid exactly. Drawing elements shall all lie in the positive portion of the drawing coordinate system.

k.   Exploded entities
Entities that are supposed to be grouped into one unit shall remain in this form. Text, dimensions, and blocks shall not be exploded, either manually or automatically during a conversion process.

2.   Submittal documentation

A documentation file named "readme.txt" that contains important information about the project and the associated computer files shall be included with the drawing and project files on the delivery disk(s). At a minimum, this file shall contain the following:

a.   Project information:
         (a) ESD project number, PWCC project number, and project title
         (b) Client Agency, facility, and building
         (c) Consultant name, address, and phone number
         (d) Project Manager and Client Agency contact person
         (e) Contractor name, address, and phone number
         (f) Scope of work

b.   Files listing:
         (a) Drawing files, including brief description of each
         (b) Font shape files, including a brief description of the character type of the font
         (c) A list of all CAD-related software used in the production of the submittal, including any add-on packages

c.   Layer naming schedule (if not following the AIA Layer Guidelines):
         (a) Layer names, including brief description of each

    d.   Pen table:
           (a) A pen table showing layer colors and corresponding pen weights used for plotting

FILE TRANSFER STANDARDS

These standards apply to all computer files delivered to ESD Facility Services Division.

1.   **File format**

Files shall be in a format compatible with the Microsoft Windows operating system. The compatibility of files created on computers using other operating systems shall be verified prior to delivery.

Files formats shall be compatible with Microsoft Office 97. Use of other software should be approved by Facility Services.

2.   **Fonts**

If non-standard fonts are used in a document, copies of the font files shall be provided. Fonts that cannot be provided without violating copyright law shall not be used.

3.   **Computer media**

Files shall be submitted on 3.5" floppy disks, CD-ROM, or via e-mail attachment. Submittals of a size greater than 10MB shall be distributed and delivered on CD-ROM.

4.   **File compression**

Files may be provided in either a standard .zip archive file format or a self-extracting .exe archive file format. Other archiving and/or compression formats are not acceptable.

End of Appendix 1 - E